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PATENT ABSTRACTS OF JAPAN

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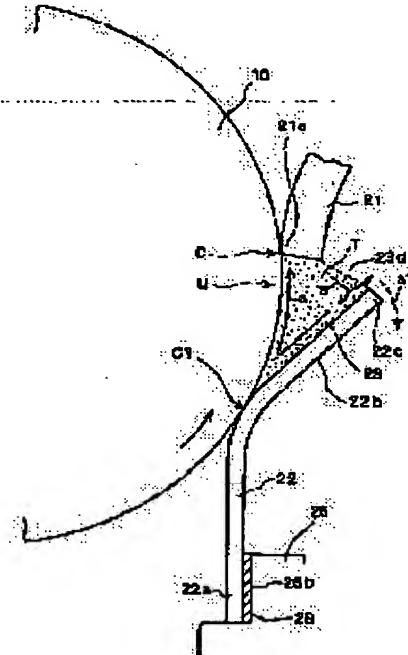
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(54) IMAGE FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To hardly cause turn-up of a blade even in the case that the contact pressure and/or the contact angle of a cleaning blade is increased.

SOLUTION: This image forming device is provided with the blade 21 to scraped off toner remaining on an image carrier 10 which is a rotary body to carry a toner image after the toner image on the image carrier 10 is transferred while coming into contact with the surface of the image carrier 10 and a scoop sheet 22 to scoop the toner scraped off by the blade while coming into contact with the image carrier on a lower side than the contact part C of the image carrier and the blade, and the top part 22c of the scoop sheet is extended by having an interval with an image carrier surface, and a toner storing part by which the toner scraped off by the blade is always heaped at the contact part C of the image carrier and the blade and a part U right under the part C is formed of an extended part 22b.



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CLAIMS

[Claim(s)]

[Claim 1] Image support which is the body of revolution which supports a toner image A cleaning blade which scratches a toner which remains on image support after contacting a front face of this image support and imprinting a toner image on image support Rather than the contact section of image support and a cleaning blade, it sets caudad, image support is contacted, a toner scratched by said cleaning blade is scooped up and scooped up, and it is a sheet. It is image formation equipment equipped with the above, and it saves, and a point of a sheet separates a gap from an image support front face, and is installed, and it is characterized by forming toner **** on which this installation section makes the contact section and its direct lower part of said image support and cleaning blade always deposit toner scratched by said cleaning blade.

[Claim 2] Image formation equipment according to claim 1 characterized by preparing said supporter material which saves and supports a sheet towards an image support side [near the contact section with said image support], and being.

[Claim 3] Image formation equipment according to claim 1 or 2 with which it saves and surface roughness Rz of a sheet is characterized by said thing [that it is 1/5 or less / of toner particle size].

[Claim 4] Claims 1 and 2 characterized by consisting of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity, or image formation equipment given in three.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to image formation equipments, such as a printer which forms an image using electrophotographic technology, facsimile, and a copying machine. It is related with the cleaning equipment using the cleaning blade (only henceforth a blade) which removes the residual toner on the image support which supports the toner image especially.

[0002]

[Description of the Prior Art] Generally the image formation equipment using electrophotographic technology The photo conductor (an example of image support) which has a sensitization layer in a peripheral face, and an electrification means to electrify the peripheral face of this photo conductor uniformly. An exposure means to expose selectively the peripheral face uniformly electrified by this electrification means, and to form an electrostatic latent image. The development means which gives the toner which is a developer to the electrostatic latent image formed by this exposure means, and is used as a visible image (toner image). An imprint means to make transfer media, such as a form, imprint the toner image developed by this development means, and the front face of a photo conductor are contacted, and it has cleaning equipment using the cleaning blade which scratches the toner (residual toner) which remains in the peripheral face of a photo conductor after an imprint, and removes it.

[0003] Moreover, as an imprint means, in order to imprint the toner image on a photo conductor to record media, such as a form, the toner image formed on the photo conductor is imprinted (primary imprint), this is supported, and the thing equipped with the medium imprint object (an example of image support) which imprints this toner image to a record medium further (secondary imprint) is known. The cleaning blade which scratches the toner (residual toner) which remains on that front face also on this medium imprint object, and removes it after a toner image imprint on it is prepared.

[0004]

[Problem(s) to be Solved by the Invention] In recent years, in the image formation equipment using electrophotographic technology, high-definition-izing (diameter[of a granule]-izing of a toner), improvement in the speed, and reinforcement are desired. In order to meet this want, especially the want of high-definition-izing (diameter[of a granule]-izing of a toner), in order to remove the toner which remained on image support after the toner image imprint good, it is necessary to raise cleaning nature, and it possible to increase the contact pressure and/or the contact angle of a cleaning blade over the front face of image support as one policy for it.

[0005] However, if the contact pressure of a cleaning blade to the front face of image support is increased, since the frictional force between a blade and an image support front face will become large, when especially a contact angle is enlarged, the problem that a blade becomes easy to get turned up arises. It especially becomes easy to be generated the time of the residual toner in an image support front face forming few image patterns that he can be this blade earnestly, and under a high-humidity/temperature environment.

[0006] The object of this invention is to offer the image formation equipment which **** of a blade cannot produce easily, even when solving the above problems and increasing the contact pressure and/or the contact angle of a cleaning blade.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned object image formation equipment according to claim 1 A front face of image support which is the body of revolution which supports a toner image, and this image support is contacted. A cleaning blade which scratches a toner which remains on image support after a toner image on image support is imprinted. Rather than the contact section of image support and a cleaning blade, set caudad and image support is contacted. It is image formation equipment which scoops up a toner scratched by said cleaning blade and which saved and was equipped with a sheet. It saves, and a point of a sheet separates a gap from an image support front face, and is installed, and this installation section is characterized by forming toner **** on which the contact section and its direct lower part of said image support and cleaning blade are made to always deposit said toner scratched by said cleaning blade. It is characterized by preparing said supporter material which saves and supports a sheet towards an image support side [near the contact section with said image support], and being in image formation equipment according to claim 2 in image formation equipment according to claim 1. In image formation equipment according to claim 1 or 2, it saves and image formation equipment according to claim 3 is characterized by said thing [that the surface roughness Rz of a sheet is 1/5 or less / of toner particle size]. In addition, "toner particle size" is the semantics of number mean particle diameter of a toner used with this

image formation equipment. Image formation equipment according to claim 4 is characterized by consisting of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity in claims 1 and 2 or image formation equipment given in three.

[0008]

[Function and Effect] The toner which remains on image support after the toner image on the image support which is the body of revolution which supports a toner image according to image formation equipment according to claim 1 is imprinted is taken [it scratches it and] and removed by the cleaning blade in contact with the front face of image support, this scratched toner saves, and it is saved with a sheet. And according to this image formation equipment according to claim 1, the point of the pile sheet described a front separates a gap from an image support front face, and is installed. Since this installation section forms toner **** on which the contact section and its direct lower part of said image support and cleaning blade are made to always deposit the toner scratched by said cleaning blade According to the operation as lubricant of the toner deposited on said contact section and its direct lower part, it is hard to produce **** of a blade and it becomes so that it may explain below. That is, since the toner scratched with the blade has always accumulated on the contact section and its direct lower part of image support and a cleaning blade, a toner will always be supplied to the contact section of the rotating image support and a cleaning blade, without being influenced by the image pattern. Since a toner has the operation as lubricant, even when the frictional force between a blade and an image support front face declines and the contact pressure and/or the contact angle of a blade are increased as a result by existence of this toner, it is hard coming to generate **** of a blade. Moreover, it is hard coming to generate blade **** under a high-humidity/temperature environment for the same reason. As mentioned above, according to this image formation equipment according to claim 1, even when increasing the contact pressure and/or the contact angle of a cleaning blade, it is hard coming to generate **** of a blade. moreover, a cleaning blade — being the so-called — a stick slip — according to this image formation equipment according to claim 1, although behavior has removed the toner, when the frictional force between a blade and an image support front face declines, the above-mentioned behavior will be stabilized and the cleaning engine performance will improve further as a result.

[0009] And since toner **** on which the contact section and its direct lower part of image support and a cleaning blade are made to always deposit the toner scratched by the cleaning blade is formed in the installation section which saved, separated the image support front face and the gap and installed the point of a sheet, the still more nearly following operation effects are acquired. That is, since it saves and the sheet touches image support, it fine-vibrates according to the revolution of image support. although it will circulate through the toner deposited in the operation of said toner **** according to the hand of cut of image support, the toner of the diameter of a granule supplies it to the contact section of image support and a blade comparatively according to an operation of the above-mentioned fine oscillation in this case — having — being easy — the frictional force between a blade and an image support front face falls to fitness further with the toner of this diameter of a granule — things — ** Therefore, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be further obtained by fitness. Moreover, since it is formed in the installation section in which it saved into, and toner **** separated the image support front face and the gap, and installed the point of a sheet, circulation of the toner mentioned above will be made efficiently. Therefore, since supply in said contact section of the toner of the diameter of a granule will also be made comparatively efficiently, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. Furthermore, toner **** saves, as a result currently formed in the installation section which separated the image support front face and the gap and installed the point of a sheet, it will save, the gap of an image support front face and said installation section will be small [near the contact section of a sheet and image support], and a toner will accumulate promptly in the activity early stages of the part and image formation equipment.

[0010] In addition, as conventional cleaning equipment, as shown in drawing 5 (a) or (b) A toner is made to deposit on the space S of the contact section C of the image support 1 and the cleaning blade 3 which are rotated in the direction of arrow head A in which the contact section C and a gap were separated and prepared caudad. With this deposited toner Although what was going to remove the various foreign matters which deposited from paper is known (JP,1-161288,A), with this conventional cleaning equipment A toner accumulates on the space S in which the contact section C and a gap were separated and prepared under the contact section C of the image support 1 and a cleaning blade 3. Since a toner does not necessarily accumulate on the contact section and its direct lower part of image support and a cleaning blade like invention of the claim 1 above-mentioned publication, and it does not save and toner **** is not necessarily formed in the installation section of a sheet 4 The above-mentioned operation effect by invention according to claim 1 is not acquired.

[0011] Since according to image formation equipment according to claim 2 said supporter material which saves and supports a sheet towards an image support side [near the contact section with said image support] is prepared and is in image formation equipment according to claim 1, in spite of forming toner **** in said installation section, it will save and the leakage of the toner in the contact section of a sheet and image support will be prevented certainly. According to image formation equipment according to claim 3, in image formation equipment according to claim 1 or 2, said circulation effectiveness of the toner which saved, and it becomes easy to move a toner and deposited the front face of a sheet since it saved and the surface roughness Rz of a sheet had become 1/5 or less [of toner particle size] improves further. Therefore, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant

action and the cleaning engine performance will be obtained much more certainly. According to image formation equipment according to claim 4, in claims 1 and 2 or image formation equipment given in three, since it consists of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity, the still more nearly following operation effects are acquired. Namely, the toner (residual toner) which remains on image support after the toner image on image support is imprinted is in the condition that that from which what was charged in a certain polarity, and it became reversed polarity was intermingled. Therefore, when this is left, there is a possibility that the circulation effectiveness of the toner deposited by the adsorption power of toners as mentioned above may fall. On the other hand, since it consists of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity according to this image formation equipment according to claim 4 The deposited toner will be arranged with like-pole nature by saving, after depositing, contacting a sheet or ****ing, in case the residual toner adhering to an image support front face saves and between sheets is passed through. Therefore, the circulation effectiveness of the deposited toner will improve further, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

The outline positive cross section and drawing 2 which show the gestalt of operation of the 1st of the image formation equipment which <gestalt of the 1st operation> drawing 1 requires for this invention are the enlarged view of the important section.

[0013] This image formation equipment is equipment which can form a full color image using yellow (Y), cyanogen (C), a Magenta (M), and the development counter by the toner of four colors of black (K).

[0014] In drawing 1, 10 is a photo conductor as image support, and revolution actuation is carried out in the direction of a graphic display arrow head by the proper driving means which is not illustrated. Around the photo conductor 10, the electrification roller 12 as an electrification means, the developing roller 13 (Y, C, M, K) as a development means, medium imprint equipment 30, and cleaning equipment 20 are arranged along the hand of cut.

[0015] The electrification roller 12 electrifies a peripheral face uniformly in contact with the peripheral face of a photo conductor 10. The alternative exposure L according to desired image information is made with the exposure unit which is not illustrated in the peripheral face of the photo conductor 10 charged uniformly, and an electrostatic latent image is formed on a photo conductor 10 of this exposure L. With a developing roller 13, a toner is given and this electrostatic latent image is developed. With the gestalt of this operation, developing-roller 13K for developing-roller 13M and blacks developing-roller 13Y for yellow, developing-roller 13C for cyanogen, and for Magentas are prepared as a developing roller. When it may have comes to contact a photo conductor 10 selectively and contacts, these developing rollers 13Y, 13C, 13M, and 13K give the toner of the yellow, cyanogen, a Magenta, or the blacks to the front face of a photo conductor 10, and develop the electrostatic latent image on a photo conductor 10. The developed toner image is imprinted on the medium imprint belt 36 as a medium imprint object mentioned later (primary imprint section Tr1 reference).

[0016] The blade 21 for photo conductors which scratches the toner (residual toner) which cleaning equipment 20 remained to the peripheral face of a photo conductor 10 after the above-mentioned imprint, and has adhered (cleaning blade). With this blade 21, it is scratched and taken, and the falling toner (T) is scooped up and scooped up. A sheet 22, It has the deposition section 23 on which the falling toner is made to deposit, the receptacle section 24 which receives the toner for which this deposition section 23 was overflowed, the screw 25 conveyed in the waste toner bottle which does not illustrate the toner in this receptacle section 24, and the case 26.

[0017] As for the blade 21, the upper part is being fixed to the blade holder 27. As for the blade holder 27, the ends (ends in the direction which intersects perpendicularly with space) are attached rockable to the flanks 26a and 26a (only one side is illustrated) of a case 26 with Shafts 27a and 27a (only one side is illustrated). Between the case 26 and the blade holder 27, the blade energization spring (compression spring) 28 is formed, and point (edge) 21a of a blade 21 contacts the front face of a photo conductor 10 according to the energization force of this blade energization spring 28, and the elastic force of blade 21 self. It saves, and a sheet 22 sets caudad from the contact section C of a blade 21 and a photo conductor 10, contacts a photo conductor 10, and scoops up the toner scratched with the blade 21.

[0018] It saves, and that point 22c separates a gap from photo conductor 10 front face, and is installed, and the sheet 22 forms toner **** (22b) on which this installation section 22b makes the contact section C and its direct lower part U of a photo conductor 10 and a cleaning blade 21 always deposit the toner T scratched by said cleaning blade 21 so that it may show clearly in drawing 2. That is, the front face of a photo conductor 10 and said toner T which saves, is formed by installation section 22b of a sheet 22, and was scratched by the contact section C and its direct lower part U of a photo conductor 10 and a cleaning blade 21 with the blade 21 by this deposition section 23 always deposit the deposition section 23 in the gestalt of this operation. It saves, and the sheet 22 is extended in the direction which intersects perpendicularly with space, and the deposition section 23 is continued and formed in the lower part overall length of said contact section C. It saves, the gap of 23d is formed between point (upper bed section) 22c of a sheet 22, and a blade 21, and an excessive toner overflows to said receptacle section 24 among the toners T deposited on said deposition section 23 through this gap of 23d. It saves, and the lower 22a has fixed to clamp-face 26b of a case 26 by the glue line (for example, adhesives) 29, and the sheet 22 touches the photo

conductor 10 by the elastic force of itself. A sign C1 shows the contact section. It saves, and between that point 22c and said lower 22a, the sheet 22 touches the photo conductor 10 and forms said toner **** 22b in the upper part [section / C1 / this / contact]. if it has another way of speaking, it can set in the gestalt of this operation — it saved and, generally the sheet 22 was known conventionally — it will save, and will consist of sheets for a long time (related with the hand of cut of the image support 10 for a long time), and said toner **** 22b will be constituted from this portion (installation section) formed for a long time. That is, plate-like [which was generally known conventionally / which saved and was formed for a long time than a sheet / thin] can save, and the above-mentioned toner **** 22b can be formed by setting a sheet 22 caudad rather than the point 22c, and contacting it to a photo conductor 10. Therefore, toner **** 22b is formed so that the gap on the front face of a photo conductor may become large gradually toward the upper part.

[0019] this — by saving, since the sheet 22 touches the photo conductor 10, it fine-vibrates according to a revolution of a photo conductor 10. Although it will circulate clockwise according to the hand of cut (it sets to drawing 2 and is a counterclockwise rotation) of a photo conductor 10 as an arrow head a shows the toner T deposited in the operation of said toner **** 22b to drawing 2 , the toner of the diameter of a granule becomes comparatively according to an operation of the above-mentioned fine oscillation that the contact section C of a photo conductor 10 and a blade 21 is easy to be supplied in this case. When it explains in detail, as an arrow head a1 shows the toner of the surplus which is held in the deposition section 23 and stopped going out in the process through which the deposited toner T circulates, it will overflow to said receptacle section 24, but a photo conductor 10 and when it saves and the sheet 22 is fine-vibrating, in the upper part of the deposition section 23, the toner of the diameter of a large drop meeting-comes to be easy comparatively. Therefore, most toners which receive as the arrow head a1 showed, and are overflowed to the section 24 turn into a toner of the diameter of a large drop (the toner of the diameter of a large drop overflowing preferentially); and the toner of the diameter of a granule will remain in the deposition section 23 comparatively as a result. For this reason, the toner of the diameter of a granule becomes comparatively that the contact section C of a photo conductor 10 and a blade 21 is easy to be supplied. In addition, even if foreign matters, such as paper powder, mix in Toner T, since a foreign matter will overflow preferentially, it is hard coming to also generate the situation where a foreign matter will be supplied to said contact section C, according to an operation of the above-mentioned fine oscillation.

[0020] moreover, it can set in the gestalt of this operation — it saves, and the surface roughness Rz of a sheet 22 is constituted so that it may become 1/5 or less [of toner particle size]. Furthermore, it saves, and the frictional electrification sequence of a sheet 22 has chosen the material so that it may become the direction which electrifies a toner in predetermined electrification polarity. That is, it saves and the sheet 22 consists of materials which electrify a toner in predetermined electrification polarity. In addition, the case 26 consists of hard material, for example, hard synthetic resin.

[0021] The above cleaning equipments are constituted by the case 26 as a unit, and are attached in the frame which the main part of image formation equipment does not illustrate removable.

[0022] Medium imprint equipment 30 has endless-like the medium imprint belt 36, the secondary imprint roller 37, and the cleaning means 38 as a medium imprint object laid by a driving roller 31, four follower rollers 32, 33, 34, and 35, and each [these] roller.

[0023] the gearing with which the driving roller 31 was fixed to the edge and which does not illustrate meshes with the gearing for actuation of a photo conductor 10 (not shown) — a photo conductor 10 and abbreviation — revolution actuation is carried out with the same peripheral speed — having — therefore, the medium imprint belt 36 — a photo conductor 10 and abbreviation — circulation actuation is carried out in the direction of a graphic display arrow head with the same peripheral speed. The follower roller 35 is a primary imprint roller, and the pressure welding of it is carried out to the photo conductor 10 through the medium imprint belt 36, and it forms the primary imprint section Tr1 between a photo conductor 10 and the medium imprint belt 36 in this pressure-welding section. The electrode roller which is not illustrated through the medium imprint belt 36 in a driving roller 31 is arranged, and primary imprint voltage is impressed to the medium imprint belt 36 through the electrode roller. The follower roller 32 is a tension roller and is energizing the medium imprint belt 36 in the flare direction with the energization means which is not illustrated. The follower roller 33 is a backup roller which forms the secondary imprint section Tr2. Opposite arrangement of the secondary imprint roller 37 is carried out through the medium imprint belt 36 at this backup roller 33. The secondary imprint roller 37 can attach and detach to the medium imprint belt 36 according to the attachment-and-detachment device which is not illustrated. Secondary imprint voltage is impressed to the secondary imprint roller 37. The follower roller 34 is a backup roller for the cleaning means 38. the medium imprint which scratches the toner (secondary imprint residual toner) which the cleaning means 38 contacted the medium imprint belt 36, and has remained and adhered to the peripheral face — the body and its function — it consists of blades. this medium imprint — the body and its function — a blade can attach and detach to the medium imprint belt 36 according to the attachment-and-detachment device which is not illustrated. in addition, a medium imprint — the body and its function — the toner which failed to be scratched by the blade 38 is not illustrated — popularity is won and it is conveyed by the section with a carrier eclipse and the screw which is not illustrated to a waste toner bottle.

[0024] The toner image with which the toner image on a photo conductor 10 was imprinted on the medium imprint belt 36, and was imprinted on the medium imprint belt 36 in the primary imprint section Tr1 in the process in which circulation actuation of the medium imprint belt 36 is carried out is imprinted by the record media P, such as a form which is the object for an imprint supplied between the secondary imprint rollers 37, in the secondary imprint

section Tr2. It is fed with a record medium P from the feed equipment which is not illustrated, and it is supplied to the secondary imprint section Tr2 to predetermined timing.

[0025] The actuation of the above whole image formation equipment is as follows.

(i) If the printing command signal (image formation signal) from the host computer (personal computer etc.) which is not illustrated is inputted into the control section of image formation equipment, the medium imprint belt 36 will be in a firm-bridging condition by actuation of a tension roller 32, and revolution actuation of a photo conductor 10, a developing roller 13, and the medium imprint belt 36 will be carried out by the driving means which is not illustrated.

(ii) The peripheral face of a photo conductor 10 is uniformly charged with the electrification roller 12.

(iii) With the exposure unit which is not illustrated, the alternative exposure L according to the image information of the 1st amorous glance (for example, Magenta (M)) is made by the peripheral face of the photo conductor 10 charged uniformly, and the electrostatic latent image for Magentas is formed in it.

(iv) Only developing-roller 13M for the 1st amorous glance (for example, Magenta) contacts a photo conductor 10, the above-mentioned electrostatic latent image is developed by this, and the toner image of the 1st amorous glance (for example, Magenta) is formed on a photo conductor 10 of it.

(v) The primary imprint voltage of the electrification polarity and reversed polarity of the above-mentioned toner is impressed to the medium imprint belt 36, and the toner image formed on the photo conductor 10 is imprinted on the medium imprint belt 36 in the primary imprint section Tr1 Tr1, i.e., the pressure-welding section of a photo conductor 10 and the medium imprint belt 36. At this time, the secondary imprint roller 37 and the cleaning means 38 are estranged from the medium imprint belt 36.

(vi) After the toner (primary residual toner) which remains on a photo conductor 10 is removed by the blade 21 for photo conductors, a photo conductor 10 is discharged by the electric discharge light from the electric discharge means which is not illustrated.

(vii) Actuation of above-mentioned (ii) – (vi) is repeated if needed. That is, according to the content of the above-mentioned printing command signal, it is repeated with the 2nd amorous glance, the 3rd amorous glance, and the 4th amorous glance, and the toner image according to the content of the above-mentioned printing command signal piles up on the medium imprint belt 36, and is formed on the medium imprint belt 36.

(viii) Just before a record medium P is supplied to predetermined timing and the head of a record medium P reaches the secondary imprint section Tr2, or after reaching (in the location of the request on a record medium P in short) While the secondary imprint roller 37 is pressed by the medium imprint belt 36 to the timing by which the toner image on the medium imprint belt 36 is imprinted, secondary imprint voltage is impressed, and the toner image on the medium imprint belt 36 (fundamentally full color image) is imprinted on a record medium P. moreover, a medium imprint — the body and its function — a blade 38 contacts the medium imprint belt 36, and the toner (secondary residual toner) which remains on the medium imprint belt 36 after a secondary imprint is removed.

(ix) By passing the anchorage device which a record medium P does not illustrate, a toner image is established on a record medium P, and a record medium P is discharged out of equipment after that.

(x) If the predetermined time input of the above-mentioned image formation signal is not carried out or equipment is turned off after actuation of the above (i) – (ix) gets used, the firm-bridging condition of the medium imprint belt 36 will be canceled by actuation of a tension roller.

[0026] According to the above image formation equipments, the following operation effects are acquired.

(a) The toner which remains on the image support 10 after the toner image on the image support 10 which is the body of revolution which supports a toner image is imprinted is taken [it scratches it and] and removed by the cleaning blade 21 in contact with the front face of the image support 10, this scratched toner saves, and it is saved with a sheet 22. And according to this image formation equipment, save, and point 22c of a sheet 22 separates a gap from image support 10 front face, and is installed. Since this installation section 22b forms toner **** (22b) on which the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21 are made to always deposit the toner scratched by the cleaning blade 21 According to the operation as lubricant of the toner T deposited on said contact section C and its direct lower part U, it is hard to produce **** of a blade 21, and it becomes so that it may explain below. That is, since the toner scratched with the blade 21 has always accumulated on the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21, a toner will always be supplied to the contact section C of the rotating image support 10 and a cleaning blade 21, without being influenced by the image pattern. Since a toner has the operation as lubricant, even when the frictional force between a blade 21 and image support 10 front face declines and the contact pressure and/or the contact angle of a blade 21 are increased as a result by existence of this toner, it is hard coming to generate **** of a blade 21. Moreover, it is hard coming to generate blade **** under a high-humidity/temperature environment for the same reason. As mentioned above, according to the image formation equipment of the gestalt of this operation, even when increasing the contact pressure and/or the contact angle of a cleaning blade 21, it is hard coming to generate **** of a blade 21. moreover, the cleaning blade 21 — being the so-called — a stick slip — according to this image formation equipment, although behavior has removed the toner, when the frictional force between a blade 21 and image support 10 front face declines, the above-mentioned behavior will be stabilized and the cleaning engine performance will improve further as a result.

[0027] And since toner **** 22b on which the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21 are made to always deposit the toner scratched by the cleaning blade 21 is formed by the installation section 22b which saved, separated image support 10 front face and the gap, and installed point 22c of a sheet 22, the still more nearly following operation effects are acquired. That is, since it saves and the sheet 22

touches the image support 10, it fine-vibrates according to the revolution of the image support 10. although it will circulate through the toner deposited in the operation of toner **** 22b according to the hand of cut of the image support 10, the toner of the diameter of a granule supplies it to the contact section C of the image support 10 and a blade 21 comparatively according to an operation of the above-mentioned fine oscillation in this case — having — being easy — the frictional force between a blade 21 and image support 10 front face falls to fitness further with the toner of this diameter of a granule — things — ** Therefore, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be further obtained by fitness. Moreover, since it is formed by the installation section 22b in which it saved into, and toner **** 22b separated image support 10 front face and the gap, and installed point 22c of a sheet 22, circulation of the toner mentioned above will be made efficiently. Therefore, since supply in said contact section C of the toner of the diameter of a granule will also be made comparatively efficiently, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade 21 mentioned above will get turned up, and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. furthermore, as a result currently formed by the installation section 22b in which it saved into, and toner **** 22b separated the image support front face and the gap, and installed point 22c of a sheet It saves and the gap of image support 10 front face and said installation section 22b is small in the about one contact section C of a sheet 22 and the image support 10. In the activity early stages of the part and image formation equipment (for example, when it is provided for a user and an activity is started), a toner will accumulate promptly.

[0028] In addition, in the activity early stages of image formation equipment, although it is a short time by the time a toner accumulates, some time amount will be taken, but since lubricant, such as polyvinylidene fluoride, is usually applied on the surface of the blade in this seed image formation equipment in order to prevent blade **** in the early stages of an activity, blade **** does not necessarily arise in the activity first stage until a toner accumulates.

[0029] (b) Since toner **** 22b saves and is formed in the installation section of a sheet 22, save and it becomes unnecessary to prepare the member for toner deposition special in addition to sheet 22. Therefore, components mark are reduced and it is reduced also like an assembler.

(c) Since it saves and the surface roughness Rz of a sheet 22 has become 1/5 or less [of toner particle size], save and the circulation effectiveness of the toner which it becomes easy to move a toner and deposited the front face of a sheet 22 improves further. Therefore, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade 21 mentioned above will get turned up, and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

(d) Since it consists of materials with which it saves and a sheet 22 electrifies a toner in predetermined electrification polarity, the still more nearly following operation effects are acquired. Namely, the toner (residual toner) which remains on the image support 10 after the toner image on the image support 10 is imprinted is in the condition that that from which what was charged in a certain polarity; and it became reversed polarity was intermingled. Therefore, when this is left, there is a possibility that the circulation effectiveness of the toner deposited by the adsorption power of toners as mentioned above may fall. On the other hand, since it consists of materials with which it saves and a sheet 22 electrifies a toner in predetermined electrification polarity according to the image formation equipment of the gestalt of this operation The deposited toner will be arranged with like-pole nature by saving, after depositing, contacting a sheet 22 or ****ing, in case the residual toner adhering to image support 10 front face saves and between sheets 22 (said contact portion C1) is passed through. Therefore, the circulation effectiveness of the deposited toner T will improve further, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

(e) Since it has a cleaning means 38 to remove the medium imprint object 36 and its secondary residual toner according to the image formation equipment of the gestalt of this operation, the following operation effects are acquired. Supposing it makes the toner image formed on the photo conductor 10 the configuration which the record media P, such as a form, are made to imprint directly, without establishing the medium imprint object 36, foreign matters, such as paper powder which adhered to photo conductor 10 front face from the form etc. in the imprint section (Tr1 reference), will be scratched by the blade 21 with a residual toner. Therefore, supposing the toner scratched with the blade 21 makes it the configuration always deposited on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21, foreign matters, such as paper powder, will also be deposited with a toner, and there is a possibility that photo conductor 10 front face or a blade 21 may be deleted with this paper powder etc. On the other hand, since it has a cleaning means 38 to remove the medium imprint object 36 and its secondary residual toner according to the image formation equipment of the gestalt of this operation, the paper powder which adhered to the medium imprint object 36 from the form etc. in the secondary imprint section Tr2 will be removed by the cleaning means 38 with a secondary residual toner. In the image formation equipment of the gestalt of this operation, namely, contacting in the primary imprint section Tr1 to a photo conductor 10 Since it is the medium imprint object 36 in the condition of paper powder etc. having been removed and having become beautiful, In spite of being the configuration which the toner (primary residual toner) scratched with the blade 21 always deposits on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21 The situation where foreign matters, such as paper powder, will accumulate with a primary residual toner stops arising (the amount will become very little even if a foreign matter accumulates). And as mentioned above, even if foreign matters, such as paper powder, mix in the toner T to deposit, since a foreign matter will overflow preferentially, it is

very hard coming to generate the situation where a foreign matter will be supplied to said contact section C, according to an operation of the above-mentioned fine oscillation. Therefore, in spite of being the configuration which the toner (primary residual toner) T scratched with the blade 21 always deposits on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21, a possibility of saying that photo conductor 10 front face or a blade 21 will be deleted with paper powder etc. disappears.

[0030] <Gestalt of the 2nd operation> drawing 3 is the enlarged view in the gestalt of operation of the 2nd of the image formation equipment concerning this invention in which saving into and showing sheet 22 portion. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0031] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is saved, carries out crookedness formation of the sheet 22 beforehand at the character type of "##", and is in the point of having made it make the image support 10 contacting by 22d of that flection, and there is no change in other points. Also according to the gestalt of this operation, the operation effect by the gestalt of implementation of the above 1st and the same operation effect are acquired.

[0032] <Gestalt of the 3rd operation> drawing 4 (a) is the enlarged view in the gestalt of operation of the 3rd of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and its supporter material 40. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0033] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is in the point in which the supporter material 40 which saves and supports a sheet 22 towards the image support 10 side in the about one contact section C with the image support 10 is formed, and is, and there is no change in other points. The supporter material 40 is a plate which saves in the direction which intersects perpendicularly with space, and has the same length as a sheet 22, it was saved, has fixed by glue line 29a to lower 22a of a sheet 22, and has fixed to clamp-face 26b of a case 26 by glue line 29b with this another supporter material 40. Up 40a of the supporter material 40 is prolonged to the about one contact section C with the image support 10, was saved and has backed up the sheet 22. Also according to the gestalt of this operation, the operation effect by the gestalt of the 1st operation and the same operation effect are acquired. Furthermore, since it saves and the sheet 22 is supported by the supporter material 40 towards the image support 10 side in the about one contact section C with the image support 10, the following operation effects are acquired. If it is the configuration which a toner deposits on toner **** (installation section) 22b which saved and installed the sheet 22, the inclination to save and for the contact force of a sheet 22 and the image support 10 to become weak with the weight of the toner will arise. On the other hand, since it saves and the sheet 22 is supported by the supporter material 40 towards the image support 10 side with the gestalt of this operation in the about one contact section C with the image support 10 In spite of forming toner **** by said installation section 22b, it will save, the contact force in the contact section C1 of a sheet 22 and the image support 10 will be secured, and the leakage of a toner will be prevented certainly. moreover — since it saved and the supporter material 40 has fixed on the sheet 22 — saving — a sheet 22 — also getting twisted — it will be controlled.

[0034] <Gestalt of the 4th operation> drawing 4 (b) is the enlarged view in the gestalt of operation of the 4th of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and its supporter material 41. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0035] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is in the point in which different supporter material 41 from the gestalt of implementation of the above 3rd which saves and supports a sheet 22 towards the image support 10 side in the about one contact section C with the image support 10 is formed, and is, and there is no change in other points. The supporter material 41 of the gestalt of this operation is the plate of the abbreviation mold for L characters which saves in the direction which intersects perpendicularly with space, and has the same length as a sheet 22, and that lower 41a fixes in a case 26 by glue line 29c, and that up 41b saves and is supporting the sheet 22 in the upper part somewhat rather than contact section C1 portion with the image support 10. It saves with up 41b of the supporter material 41, and the contact section with a sheet 22 may fix with adhesives etc., and does not need to fix. Also according to the gestalt of this operation, the operation effect by the gestalt of implementation of the above 3rd and the same operation effect are acquired.

[0036] As mentioned above, although the gestalt of operation of this invention was explained, this invention is not limited to the gestalt of the above-mentioned operation, and deformation implementation is possible for it suitably within the limits of the summary of this invention. For example, although the gestalt of the above-mentioned implementation explained the case where image support was a photo conductor, this invention can be applied also when image support is a medium imprint object. Moreover, although the gestalt of the above-mentioned implementation explained the case where image support (photo conductor) was cylindrical, this invention can be applied also when image support is a belt-like.

[0037]

[Effect of the Invention] Even when increasing the contact pressure and/or the contact angle of a cleaning blade, it is hard coming to generate **** of a blade with any image formation equipment according to claim 1 to 4. moreover, a cleaning blade — being the so-called — a stick slip — behavior will be stabilized and the cleaning engine performance will improve further as a result. And the toner of the diameter of a granule becomes comparatively that the contact section of image support and a blade is easy to be supplied, a blade will be turned up, and improvement

in depressant action and the cleaning engine performance will be further obtained by fitness. Furthermore, in the activity early stages of image formation equipment, a toner will accumulate promptly. Furthermore, according to image formation equipment according to claim 2, it will save and the leakage of the toner in the contact section of a sheet and image support will be prevented certainly. According to image formation equipment according to claim 3, a blade will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. According to image formation equipment according to claim 4, a blade will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. [0038]

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] This invention relates to image formation equipments, such as a printer which forms an image using electrophotographic technology, facsimile, and a copying machine. It is related with the cleaning equipment using the cleaning blade (only henceforth a blade) which removes the residual toner on the image support which supports the toner image especially.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] Image formation equipment generally using electrophotographic technology. The photo conductor (an example of image support) which has a sensitization layer in a peripheral face, and an electrification means to electrify the peripheral face of this photo conductor uniformly. An exposure means to expose selectively the peripheral face uniformly electrified by this electrification means, and to form an electrostatic latent image. The development means which gives the toner which is a developer to the electrostatic latent image formed by this exposure means, and is used as a visible image (toner image). An imprint means to make transfer media, such as a form, imprint the toner image developed by this development means, and the front face of a photo conductor are contacted, and it has cleaning equipment using the cleaning blade which scratches the toner (residual toner) which remains in the peripheral face of a photo conductor after an imprint, and removes it.

[0003] Moreover, as an imprint means, in order to imprint the toner image on a photo conductor to record media, such as a form, the toner image formed on the photo conductor is imprinted (primary imprint), this is supported, and the thing equipped with the medium imprint object (an example of image support) which imprints this toner image to a record medium further (secondary imprint) is known. The cleaning blade which scratches the toner (residual toner) which remains on that front face also on this medium imprint object, and removes it after a toner image imprint on it is prepared.

[Translation done.]

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EFFECT OF THE INVENTION

[Function and Effect] The toner which remains on image support after the toner image on the image support which is the body of revolution which supports a toner image according to image formation equipment according to claim 1 is imprinted is taken [it scratches it and] and removed by the cleaning blade in contact with the front face of image support, this scratched toner saves, and it is saved with a sheet. And according to this image formation equipment according to claim 1, the point of the pile sheet described a front separates a gap from an image support front face, and is installed. Since this installation section forms toner **** on which the contact section and its direct lower part of said image support and cleaning blade are made to always deposit the toner scratched by said cleaning blade According to the operation as lubricant of the toner deposited on said contact section and its direct lower part, it is hard to produce **** of a blade and it becomes so that it may explain below. That is, since the toner scratched with the blade has always accumulated on the contact section and its direct lower part of image support and a cleaning blade, a toner will always be supplied to the contact section of the rotating image support and a cleaning blade, without being influenced by the image pattern. Since a toner has the operation as lubricant, even when the frictional force between a blade and an image support front face declines and the contact pressure and/or the contact angle of a blade are increased as a result by existence of this toner, it is hard coming to generate **** of a blade. Moreover, it is hard coming to generate blade **** under a high-humidity/temperature environment for the same reason. As mentioned above, according to this image formation equipment according to claim 1, even when increasing the contact pressure and/or the contact angle of a cleaning blade, it is hard coming to generate **** of a blade. moreover, a cleaning blade — being the so-called — a stick slip — according to this image formation equipment according to claim 1, although behavior has removed the toner, when the frictional force between a blade and an image support front face declines, the above-mentioned behavior will be stabilized and the cleaning engine performance will improve further as a result.

[0009] And since toner **** on which the contact section and its direct lower part of image support and a cleaning blade are made to always deposit the toner scratched by the cleaning blade is formed in the installation section which saved, separated the image support front face and the gap and installed the point of a sheet, the still more nearly following operation effects are acquired. That is, since it saves and the sheet touches image support, it fine-vibrates according to the revolution of image support. although it will circulate through the toner deposited in the operation of said toner **** according to the hand of cut of image support, the toner of the diameter of a granule supplies it to the contact section of image support and a blade comparatively according to an operation of the above-mentioned fine oscillation in this case — having — being easy — the frictional force between a blade and an image support front face falls to fitness further with the toner of this diameter of a granule — things — ** Therefore, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be further obtained by fitness. Moreover, since it is formed in the installation section in which it saved into, and toner **** separated the image support front face and the gap, and installed the point of a sheet, circulation of the toner mentioned above will be made efficiently. Therefore, since supply in said contact section of the toner of the diameter of a granule will also be made comparatively efficiently, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. Furthermore, toner **** saves, as a result currently formed in the installation section which separated the image support front face and the gap and installed the point of a sheet, it will save, the gap of an image support front face and said installation section will be small [near the contact section of a sheet and image support], and a toner will accumulate promptly in the activity early stages of the part and image formation equipment.

[0010] In addition, as conventional cleaning equipment, as shown in drawing 5 (a) or (b) A toner is made to deposit on the space S of the contact section C of the image support 1 and the cleaning blade 3 which are rotated in the direction of arrow head A in which the contact section C and a gap were separated and prepared caudad. With this deposited toner Although what was going to remove the various foreign matters which deposited from paper is known (JP,1-161288,A), with this conventional cleaning equipment A toner accumulates on the space S in which the contact section C and a gap were separated and prepared under the contact section C of the image support 1 and a cleaning blade 3. Since a toner does not necessarily accumulate on the contact section and its direct lower part of image support and a cleaning blade like invention of the claim 1 above-mentioned publication, and it does not save and toner **** is not necessarily formed in the installation section of a sheet 4 The above-mentioned operation effect by invention according to claim 1 is not acquired.

[0011] Since according to image formation equipment according to claim 2 said supporter material which saves and

supports a sheet towards an image support side [near the contact section with said image support] is prepared and is in image formation equipment according to claim 1, in spite of forming toner **** in said installation section, it will save and the leakage of the toner in the contact section of a sheet and image support will be prevented certainly. According to image formation equipment according to claim 3, in image formation equipment according to claim 1 or 2, said circulation effectiveness of the toner which saved, and it becomes easy to move a toner and deposited the front face of a sheet since it saved and the surface roughness Rz of a sheet had become 1/5 or less [of toner particle size] improves further. Therefore, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. According to image formation equipment according to claim 4, in claims 1 and 2 or image formation equipment given in three, since it consists of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity, the still more nearly following operation effects are acquired. Namely, the toner (residual toner) which remains on image support after the toner image on image support is imprinted is in the condition that that from which what was charged in a certain polarity, and it became reversed polarity was intermingled. Therefore, when this is left, there is a possibility that the circulation effectiveness of the toner deposited by the adsorption power of toners as mentioned above may fall. On the other hand, since it consists of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity according to this image formation equipment according to claim 4 The deposited toner will be arranged with like-pole nature by saving, after depositing, contacting a sheet or ***ing, in case the residual toner adhering to an image support front face saves and between sheets is passed through. Therefore, the circulation effectiveness of the deposited toner will improve further, the frictional force between a blade and an image support front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

The outline positive cross section and drawing 2 which show the gestalt of operation of the 1st of the image formation equipment which <gestalt of the 1st operation> drawing 1 requires for this invention are the enlarged view of the important section.

[0013] This image formation equipment is equipment which can form a full color image using yellow (Y), cyanogen (C), a Magenta (M), and the development counter by the toner of four colors of black (K).

[0014] In drawing 1, 10 is a photo conductor as image support, and revolution actuation is carried out in the direction of a graphic display arrow head by the proper driving means which is not illustrated. Around the photo conductor 10, the electrification roller 12 as an electrification means, the developing roller 13 (Y, C, M, K) as a development means, medium imprint equipment 30, and cleaning equipment 20 are arranged along the hand of cut.

[0015] The electrification roller 12 electrifies a peripheral face uniformly in contact with the peripheral face of a photo conductor 10. The alternative exposure L according to desired image information is made with the exposure unit which is not illustrated in the peripheral face of the photo conductor 10 charged uniformly, and an electrostatic latent image is formed on a photo conductor 10 of this exposure L. With a developing roller 13, a toner is given and this electrostatic latent image is developed. With the gestalt of this operation, developing-roller 13K for developing-roller 13M and blacks developing-roller 13Y for yellow, developing-roller 13C for cyanogen, and for Magentas are prepared as a developing roller. When it may have comes to contact a photo conductor 10 selectively and contacts, these developing rollers 13Y, 13C, 13M, and 13K give the toner of the yellow, cyanogen, a Magenta, or the blacks to the front face of a photo conductor 10, and develop the electrostatic latent image on a photo conductor 10. The developed toner image is imprinted on the medium imprint belt 36 as a medium imprint object mentioned later (primary imprint section Tr1 reference).

[0016] The blade 21 for photo conductors which scratches the toner (residual toner) which cleaning equipment 20 remained to the peripheral face of a photo conductor 10 after the above-mentioned imprint, and has adhered (cleaning blade). With this blade 21, it is scratched and taken, and the falling toner (T) is scooped up and scooped up. A sheet 22, It has the deposition section 23 on which the falling toner is made to deposit, the receptacle section 24 which receives the toner for which this deposition section 23 was overflowed, the screw 25 conveyed in the waste toner bottle which does not illustrate the toner in this receptacle section 24, and the case 26.

[0017] As for the blade 21, the upper part is being fixed to the blade holder 27. As for the blade holder 27, the ends (ends in the direction which intersects perpendicularly with space) are attached rockable to the flanks 26a and 26a (only one side is illustrated) of a case 26 with Shafts 27a and 27a (only one side is illustrated). Between the case 26 and the blade holder 27, the blade energization spring (compression spring) 28 is formed, and point (edge) 21a of a blade 21 contacts the front face of a photo conductor 10 according to the energization force of this blade energization spring 28, and the elastic force of blade 21 self. It saves, and a sheet 22 sets caudad from the contact section C of a blade 21 and a photo conductor 10, contacts a photo conductor 10, and scoops up the toner scratched with the blade 21.

[0018] It saves, and that point 22c separates a gap from photo conductor 10 front face, and is installed, and the sheet 22 forms toner **** (22b) on which this installation section 22b makes the contact section C and its direct lower part U of a photo conductor 10 and a cleaning blade 21 always deposit the toner T scratched by said cleaning blade 21 so that it may show clearly in drawing 2. That is, the front face of a photo conductor 10 and said toner T

which saves, is formed by installation section 22b of a sheet 22, and was scratched by the contact section C and its direct lower part U of a photo conductor 10 and a cleaning blade 21 with the blade 21 by this deposition section 23 always deposit the deposition section 23 in the gestalt of this operation. It saves, and the sheet 22 is extended in the direction which intersects perpendicularly with space, and the deposition section 23 is continued and formed in the lower part overall length of said contact section C. It saves, the gap of 23d is formed between point (upper bed section) 22c of a sheet 22, and a blade 21, and an excessive toner overflows to said receptacle section 24 among the toners T deposited on said deposition section 23 through this gap of 23d. It saves, and the lower 22a has fixed to clamp-face 26b of a case 26 by the glue line (for example, adhesives) 29, and the sheet 22 touches the photo conductor 10 by the elastic force of itself. A sign C1 shows the contact section. It saves, and between that point 22c and said lower 22a, the sheet 22 touches the photo conductor 10 and forms said toner **** 22b in the upper part [section / C1 / this / contact]. if it has another way of speaking, it can set in the gestalt of this operation — it saved and, generally the sheet 22 was known conventionally — it will save, and will consist of sheets for a long time (related with the hand of cut of the image support 10 for a long time), and said toner **** 22b will be constituted from this portion (installation section) formed for a long time. That is, plate-like [which was generally known conventionally / which saved and was formed for a long time than a sheet / thin] can save, and the above-mentioned toner **** 22b can be formed by setting a sheet 22 caudad rather than the point 22c, and contacting it to a photo conductor 10. Therefore, toner **** 22b is formed so that the gap on the front face of a photo conductor may become large gradually toward the upper part.

[0019] this — by saving, since the sheet 22 touches the photo conductor 10, it fine-vibrates according to a revolution of a photo conductor 10. Although it will circulate clockwise according to the hand of cut (it sets to drawing 2 and is a counterclockwise rotation) of a photo conductor 10 as an arrow head a shows the toner T deposited in the operation of said toner **** 22b to drawing 2, the toner of the diameter of a granule becomes comparatively according to an operation of the above-mentioned fine oscillation that the contact section C of a photo conductor 10 and a blade 21 is easy to be supplied in this case. When it explains in detail, as an arrow head a1 shows the toner of the surplus which is held in the deposition section 23 and stopped going out in the process through which the deposited toner T circulates, it will overflow to said receptacle section 24, but a photo conductor 10 and when it saves and the sheet 22 is fine-vibrating, in the upper part of the deposition section 23, the toner of the diameter of a large drop meeting-comes to be easy comparatively. Therefore, most toners which receive as the arrow head a1 showed, and are overflowed to the section 24 turn into a toner of the diameter of a large drop (the toner of the diameter of a large drop overflowing preferentially), and the toner of the diameter of a granule will remain in the deposition section 23 comparatively as a result. For this reason, the toner of the diameter of a granule becomes comparatively that the contact section C of a photo conductor 10 and a blade 21 is easy to be supplied. In addition, even if foreign matters, such as paper powder, mix in Toner T, since a foreign matter will overflow preferentially, it is hard coming to also generate the situation where a foreign matter will be supplied to said contact section C, according to an operation of the above-mentioned fine oscillation.

[0020] moreover, it can set in the gestalt of this operation — it saves, and the surface roughness Rz of a sheet 22 is constituted so that it may become 1/5 or less [of toner particle size]. Furthermore, it saves, and the frictional electrification sequence of a sheet 22 has chosen the material so that it may become the direction which electrifies a toner in predetermined electrification polarity. That is, it saves and the sheet 22 consists of materials which electrify a toner in predetermined electrification polarity. In addition, the case 26 consists of hard material, for example, hard synthetic resin.

[0021] The above cleaning equipments are constituted by the case 26 as a unit, and are attached in the frame which the main part of image formation equipment does not illustrate removable.

[0022] Medium imprint equipment 30 has endless-like the medium imprint belt 36, the secondary imprint roller 37, and the cleaning means 38 as a medium imprint object laid by a driving roller 31, four follower rollers 32, 33, 34, and 35, and each [these] roller.

[0023] the gearing with which the driving roller 31 was fixed to the edge and which does not illustrate meshes with the gearing for actuation of a photo conductor 10 (not shown) — a photo conductor 10 and abbreviation — revolution actuation is carried out with the same peripheral speed — having — therefore, the medium imprint belt 36 — a photo conductor 10 and abbreviation — circulation actuation is carried out in the direction of a graphic display arrow head with the same peripheral speed. The follower roller 35 is a primary imprint roller, and the pressure welding of it is carried out to the photo conductor 10 through the medium imprint belt 36, and it forms the primary imprint section Tr1 between a photo conductor 10 and the medium imprint belt 36 in this pressure-welding section. The electrode roller which is not illustrated through the medium imprint belt 36 in a driving roller 31 is arranged, and primary imprint voltage is impressed to the medium imprint belt 36 through the electrode roller. The follower roller 32 is a tension roller and is energizing the medium imprint belt 36 in the flare direction with the energization means which is not illustrated. The follower roller 33 is a backup roller which forms the secondary imprint section Tr2. Opposite arrangement of the secondary imprint roller 37 is carried out through the medium imprint belt 36 at this backup roller 33. The secondary imprint roller 37 can attach and detach to the medium imprint belt 36 according to the attachment-and-detachment device which is not illustrated. Secondary imprint voltage is impressed to the secondary imprint roller 37. The follower roller 34 is a backup roller for the cleaning means 38. the medium imprint which scratches the toner (secondary imprint residual toner) which the cleaning means 38 contacted the medium imprint belt 36, and has remained and adhered to the peripheral face — the body and its function — it consists of blades. this medium imprint — the body and its function — a blade can attach and detach to the

medium imprint belt 36 according to the attachment-and-detachment device which is not illustrated. in addition, a medium imprint — the body and its function — the toner which failed to be scratched by the blade 38 is not illustrated — popularity is won and it is conveyed by the section with a carrier eclipse and the screw which is not illustrated to a waste toner bottle.

[0024] The toner image with which the toner image on a photo conductor 10 was imprinted on the medium imprint belt 36, and was imprinted on the medium imprint belt 36 in the primary imprint section Tr1 in the process in which circulation actuation of the medium imprint belt 36 is carried out is imprinted by the record media P, such as a form which is the object for an imprint supplied between the secondary imprint rollers 37, in the secondary imprint section Tr2. It is fed with a record medium P from the feed equipment which is not illustrated, and it is supplied to the secondary imprint section Tr2 to predetermined timing.

[0025] The actuation of the above whole image formation equipment is as follows.

(i) If the printing command signal (image formation signal) from the host computer (personal computer etc.) which is not illustrated is inputted into the control section of image formation equipment, the medium imprint belt 36 will be in a firm-bridging condition by actuation of a tension roller 32, and revolution actuation of a photo conductor 10, a developing roller 13, and the medium imprint belt 36 will be carried out by the driving means which is not illustrated.

(ii) The peripheral face of a photo conductor 10 is uniformly charged with the electrification roller 12.

(iii) With the exposure unit which is not illustrated, the alternative exposure L according to the image information of the 1st amorous glance (for example, Magenta (M)) is made by the peripheral face of the photo conductor 10 charged uniformly, and the electrostatic latent image for Magentas is formed in it.

(iv) Only developing-roller 13M for the 1st amorous glance (for example, Magenta) contacts a photo conductor 10, the above-mentioned electrostatic latent image is developed by this, and the toner image of the 1st amorous glance (for example, Magenta) is formed on a photo conductor 10 of it.

(v) The primary imprint voltage of the electrification polarity and reversed polarity of the above-mentioned toner is impressed to the medium imprint belt 36, and the toner image formed on the photo conductor 10 is imprinted on the medium imprint belt 36 in the primary imprint section Tr1 Tr1, i.e., the pressure-welding section of a photo conductor 10 and the medium imprint belt 36. At this time, the secondary imprint roller 37 and the cleaning means 38 are estranged from the medium imprint belt 36.

(vi) After the toner (primary residual toner) which remains on a photo conductor 10 is removed by the blade 21 for photo conductors, a photo conductor 10 is discharged by the electric discharge light from the electric discharge means which is not illustrated.

(vii) Actuation of above-mentioned (ii) – (vi) is repeated if needed. That is, according to the content of the above-mentioned printing command signal, it is repeated with the 2nd amorous glance, the 3rd amorous glance, and the 4th amorous glance, and the toner image according to the content of the above-mentioned printing command signal piles up on the medium imprint belt 36, and is formed on the medium imprint belt 36.

(viii) Just before a record medium P is supplied to predetermined timing and the head of a record medium P reaches the secondary imprint section Tr2, or after reaching (in the location of the request on a record medium P in short) While the secondary imprint roller 37 is pressed by the medium imprint belt 36 to the timing by which the toner image on the medium imprint belt 36 is imprinted, secondary imprint voltage is impressed, and the toner image on the medium imprint belt 36 (fundamentally full color image) is imprinted on a record medium P. moreover, a medium imprint — the body and its function — a blade 38 contacts the medium imprint belt 36, and the toner (secondary residual toner) which remains on the medium imprint belt 36 after a secondary imprint is removed.

(ix) By passing the anchorage device which a record medium P does not illustrate, a toner image is established on a record medium P, and a record medium P is discharged out of equipment after that.

(x) If the predetermined time input of the above-mentioned image formation signal is not carried out or equipment is turned off after actuation of the above (i) – (ix) gets used, the firm-bridging condition of the medium imprint belt 36 will be canceled by actuation of a tension roller.

[0026] According to the above image formation equipments, the following operation effects are acquired.

(a) The toner which remains on the image support 10 after the toner image on the image support 10 which is the body of revolution which supports a toner image is imprinted is taken [it scratches it and] and removed by the cleaning blade 21 in contact with the front face of the image support 10, this scratched toner saves, and it is saved with a sheet 22. And according to this image formation equipment, save, and point 22c of a sheet 22 separates a gap from image support 10 front face, and is installed. Since this installation section 22b forms toner **** (22b) on which the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21 are made to always deposit the toner scratched by the cleaning blade 21 According to the operation as lubricant of the toner T deposited on said contact section C and its direct lower part U, it is hard to produce **** of a blade 21, and it becomes so that it may explain below. That is, since the toner scratched with the blade 21 has always accumulated on the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21, a toner will always be supplied to the contact section C of the rotating image support 10 and a cleaning blade 21, without being influenced by the image pattern. Since a toner has the operation as lubricant, even when the frictional force between a blade 21 and image support 10 front face declines and the contact pressure and/or the contact angle of a blade 21 are increased as a result by existence of this toner, it is hard coming to generate **** of a blade 21.

Moreover, it is hard coming to generate blade **** under a high-humidity/temperature environment for the same reason. As mentioned above, according to the image formation equipment of the gestalt of this operation, even when increasing the contact pressure and/or the contact angle of a cleaning blade 21, it is hard coming to generate ***

of a blade 21, moreover, the cleaning blade 21 — being the so-called — a stick slip — according to this image formation equipment, although behavior has removed the toner, when the frictional force between a blade 21 and image support 10 front face declines, the above-mentioned behavior will be stabilized and the cleaning engine performance will improve further as a result.

[0027] And since toner **** 22b on which the contact section C and its direct lower part U of the image support 10 and a cleaning blade 21 are made to always deposit the toner scratched by the cleaning blade 21 is formed by the installation section 22b which saved, separated image support 10 front face and the gap, and installed point 22c of a sheet 22, the still more nearly following operation effects are acquired. That is, since it saves and the sheet 22 touches the image support 10, it fine-vibrates according to the revolution of the image support 10. although it will circulate through the toner deposited in the operation of toner **** 22b according to the hand of cut of the image support 10, the toner of the diameter of a granule supplies it to the contact section C of the image support 10 and a blade 21 comparatively according to an operation of the above-mentioned fine oscillation in this case — having — being easy — the frictional force between a blade 21 and image support 10 front face falls to fitness further with the toner of this diameter of a granule — things — ** Therefore, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be further obtained by fitness. Moreover, since it is formed by the installation section 22b in which it saved into, and toner **** 22b separated image support 10 front face and the gap, and installed point 22c of a sheet 22, circulation of the toner mentioned above will be made efficiently. Therefore, since supply in said contact section C of the toner of the diameter of a granule will also be made comparatively efficiently, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade 21 mentioned above will get turned up, and improvement in depressant action and the cleaning engine performance will be obtained much more certainly. furthermore, as a result currently formed by the installation section 22b in which it saved into, and toner **** 22b separated the image support front face and the gap, and installed point 22c of a sheet It saves and the gap of image support 10 front face and said installation section 22b is small in the about one contact section C of a sheet 22 and the image support 10. In the activity early stages of the part and image formation equipment (for example, when it is provided for a user and an activity is started), a toner will accumulate promptly.

[0028] In addition, in the activity early stages of image formation equipment, although it is a short time by the time a toner accumulates, some time amount will be taken, but since lubricant, such as polyvinylidene fluoride, is usually applied on the surface of the blade in this seed image formation equipment in order to prevent blade **** in the early stages of an activity, blade **** does not necessarily arise in the activity first stage until a toner accumulates.

[0029] (b) Since toner **** 22b saves and is formed in the installation section of a sheet 22, save and it becomes unnecessary to prepare the member for toner deposition special in addition to sheet 22. Therefore, components mark are reduced and it is reduced also like an assembler.

(c) Since it saves and the surface roughness Rz of a sheet 22 has become 1/5 or less [of toner particle size], save and the circulation effectiveness of the toner which it becomes easy to move a toner and deposited the front face of a sheet 22 improves further. Therefore, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade 21 mentioned above will get turned up, and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

(d) Since it consists of materials with which it saves and a sheet 22 electrifies a toner in predetermined electrification polarity, the still more nearly following operation effects are acquired. Namely, the toner (residual toner) which remains on the image support 10 after the toner image on the image support 10 is imprinted is in the condition that that from which what was charged in a certain polarity, and it became reversed polarity was intermingled. Therefore, when this is left, there is a possibility that the circulation effectiveness of the toner deposited by the adsorption power of toners as mentioned above may fall. On the other hand, since it consists of materials with which it saves and a sheet 22 electrifies a toner in predetermined electrification polarity according to the image formation equipment of the gestalt of this operation The deposited toner will be arranged with like-pole nature by saving, after depositing, contacting a sheet 22 or ****ing, in case the residual toner adhering to image support 10 front face saves and between sheets 22 (said contact portion C1) is passed through. Therefore, the circulation effectiveness of the deposited toner T will improve further, the frictional force between a blade 21 and image support 10 front face declines much more certainly, the blade mentioned above will get turned up and improvement in depressant action and the cleaning engine performance will be obtained much more certainly.

(e) Since it has a cleaning means 38 to remove the medium imprint object 36 and its secondary residual toner according to the image formation equipment of the gestalt of this operation, the following operation effects are acquired. Supposing it makes the toner image formed on the photo conductor 10 the configuration which the record media P, such as a form, are made to imprint directly, without establishing the medium imprint object 36, foreign matters, such as paper powder which adhered to photo conductor 10 front face from the form etc. in the imprint section (Tr1 reference), will be scratched by the blade 21 with a residual toner. Therefore, supposing the toner scratched with the blade 21 makes it the configuration always deposited on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21, foreign matters, such as paper powder, will also be deposited with a toner, and there is a possibility that photo conductor 10 front face or a blade 21 may be deleted with this paper powder etc. On the other hand, since it has a cleaning means 38 to remove the medium imprint object 36 and its secondary residual toner according to the image formation equipment of the gestalt of this operation, the paper powder which adhered to the medium imprint object 36 from the form etc. in the secondary imprint section Tr2 will

be removed by the cleaning means 38 with a secondary residual toner. In the image formation equipment of the gestalt of this operation, namely, contacting in the primary imprint section Tr1 to a photo conductor 10 Since it is the medium imprint object 36 in the condition of paper powder etc. having been removed and having become beautiful, In spite of being the configuration which the toner (primary residual toner) scratched with the blade 21 always deposits on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21 The situation where foreign matters, such as paper powder, will accumulate with a primary residual toner stops arising (the amount will become very little even if a foreign matter accumulates). And as mentioned above, even if foreign matters, such as paper powder, mix in the toner T to deposit, since a foreign matter will overflow preferentially, it is very hard coming to generate the situation where a foreign matter will be supplied to said contact section C, according to an operation of the above-mentioned fine oscillation. Therefore, in spite of being the configuration which the toner (primary residual toner) T scratched with the blade 21 always deposits on the contact section C and its direct lower part U of a photo conductor 10 and a blade 21, a possibility of saying that photo conductor 10 front face or a blade 21 will be deleted with paper powder etc. disappears.

[0030] <Gestalt of the 2nd operation> drawing 3 is the enlarged view in the gestalt of operation of the 2nd of the image formation equipment concerning this invention in which saving into and showing sheet 22 portion. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0031] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is saved, carries out crookedness formation of the sheet 22 beforehand at the character type of "##", and is in the point of having made it make the image support 10 contacting by 22d of that flection, and there is no change in other points. Also according to the gestalt of this operation, the operation effect by the gestalt of implementation of the above 1st and the same operation effect are acquired.

[0032] <Gestalt of the 3rd operation> drawing 4 (a) is the enlarged view in the gestalt of operation of the 3rd of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and its supporter material 40. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0033] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is in the point in which the supporter material 40 which saves and supports a sheet 22 towards the image support 10 side in the about one contact section C with the image support 10 is formed, and is, and there is no change in other points. The supporter material 40 is a plate which saves in the direction which intersects perpendicularly with space, and has the same length as a sheet 22, it was saved, has fixed by glue line 29a to lower 22a of a sheet 22, and has fixed to clamp-face 26b of a case 26 by glue line 29b with this another supporter material 40. Up 40a of the supporter material 40 is prolonged to the about one contact section C with the image support 10, was saved and has backed up the sheet 22. Also according to the gestalt of this operation, the operation effect by the gestalt of the 1st operation and the same operation effect are acquired. Furthermore, since it saves and the sheet 22 is supported by the supporter material 40 towards the image support 10 side in the about one contact section C with the image support 10, the following operation effects are acquired. If it is the configuration which a toner deposits on toner **** (installation section) 22b which saved and installed the sheet 22, the inclination to save and for the contact force of a sheet 22 and the image support 10 to become weak with the weight of the toner will arise. On the other hand, since it saves and the sheet 22 is supported by the supporter material 40 towards the image support 10 side with the gestalt of this operation in the about one contact section C with the image support 10 In spite of forming toner *** by said installation section 22b, it will save, the contact force in the contact section C1 of a sheet 22 and the image support 10 will be secured, and the leakage of a toner will be prevented certainly. moreover — since it saved and the supporter material 40 has fixed on the sheet 22 — saving — a sheet 22 — also getting twisted — it will be controlled.

[0034] <Gestalt of the 4th operation> drawing 4 (b) is the enlarged view in the gestalt of operation of the 4th of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and its supporter material 41. In this drawing, the same sign is given to the same portion as a gestalt thru/or the corresponding portion of implementation of the above 1st.

[0035] The point that the gestalt of this operation differs from the gestalt of implementation of the above 1st is in the point in which different supporter material 41 from the gestalt of implementation of the above 3rd which saves and supports a sheet 22 towards the image support 10 side in the about one contact section C with the image support 10 is formed, and is, and there is no change in other points. The supporter material 41 of the gestalt of this operation is the plate of the abbreviation mold for L characters which saves in the direction which intersects perpendicularly with space, and has the same length as a sheet 22, and that lower 41a fixes in a case 26 by glue line 29c, and that up 41b saves and is supporting the sheet 22 in the upper part somewhat rather than contact section C1 portion with the image support 10. It saves with up 41b of the supporter material 41, and the contact section with a sheet 22 may fix with adhesives etc., and does not need to fix. Also according to the gestalt of this operation, the operation effect by the gestalt of implementation of the above 3rd and the same operation effect are acquired.

[0036] As mentioned above, although the gestalt of operation of this invention was explained, this invention is not limited to the gestalt of the above-mentioned operation, and deformation implementation is possible for it suitably within the limits of the summary of this invention. For example, although the gestalt of the above-mentioned implementation explained the case where image support was a photo conductor, this invention can be applied also when image support is a medium imprint object. Moreover, although the gestalt of the above-mentioned

implementation explained the case where image support (photo conductor) was cylindrical, this invention can be applied also when image support is a belt-like.

[Translation done.]

*** NOTICES ***

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] In recent years, in the image formation equipment using electrophotographic technology, high-definition-izing (diameter[of a granule]-izing of a toner), improvement in the speed, and reinforcement are desired. In order to meet this want, especially the want of high-definition-izing (diameter[of a granule]-izing of a toner), in order to remove the toner which remained on image support after the toner image imprint good, it is necessary to raise cleaning nature, and it possible to increase the contact pressure and/or the contact angle of a cleaning blade over the front face of image support as one policy for it.

[0005] However, if the contact pressure of a cleaning blade to the front face of image support is increased, since the frictional force between a blade and an image support front face will become large, when especially a contact angle is enlarged, the problem that a blade becomes easy to get turned up arises. It especially becomes easy to be generated the time of the residual toner in an image support front face forming few image patterns that he can be this blade earnestly, and under a high-humidity/temperature environment.

[0006] The object of this invention is to offer the image formation equipment which **** of a blade cannot produce easily, even when solving the above problems and increasing the contact pressure and/or the contact angle of a cleaning blade.

[Translation done.]

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object image formation equipment according to claim 1 A front face of image support which is the body of revolution which supports a toner image, and this image support is contacted. A cleaning blade which scratches a toner which remains on image support after a toner image on image support is imprinted. Rather than the contact section of image support and a cleaning blade, set caudad and image support is contacted. It is image formation equipment which scoops up a toner scratched by said cleaning blade and which saved and was equipped with a sheet. It saves, and a point of a sheet separates a gap from an image support front face, and is installed, and this installation section is characterized by forming toner **** on which the contact section and its direct lower part of said image support and cleaning blade are made to always deposit said toner scratched by said cleaning blade. It is characterized by preparing said supporter material which saves and supports a sheet towards an image support side [near the contact section with said image support], and being in image formation equipment according to claim 2 in image formation equipment according to claim 1. In image formation equipment according to claim 1 or 2, it saves and image formation equipment according to claim 3 is characterized by said thing [that the surface roughness Rz of a sheet is 1/5 or less / of toner particle size]. In addition, "toner particle size" is the semantics of number mean particle diameter of a toner used with this image formation equipment. Image formation equipment according to claim 4 is characterized by consisting of said materials with which it saves and a sheet electrifies a toner in predetermined electrification polarity in claims 1 and 2 or image formation equipment given in three.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The outline positive cross section showing the gestalt of operation of the 1st of the image formation equipment concerning this invention.

[Drawing 2] With the enlarged view of the important section of the gestalt of the 1st operation, it is operation explanatory drawing.

[Drawing 3] The enlarged view in the gestalt of operation of the 2nd of the image formation equipment concerning this invention in which saving into and showing sheet 22 portion.

[Drawing 4] For (a), (b) is the enlarged view in the gestalt of operation of the 3rd of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and the supporter material 40, and the enlarged view in the gestalt of operation of the 4th of the image formation equipment concerning this invention in which saving into and showing a sheet 22 and the supporter material 41.

[Drawing 5] (a) and (b) are explanatory drawing of the conventional technology.

[Description of Notations]

T Toner

10 Photo Conductor (Image Support)

21 Cleaning Blade

22 Save and it is Sheet.

22b Installation section (toner ****)

22c Point

26 Case

40 41 Supporter material

C The contact section of a blade and a photo conductor

U Direct lower part

C1 It saves and is the contact section of a sheet and a photo conductor.

[Translation done.]

* NOTICES *

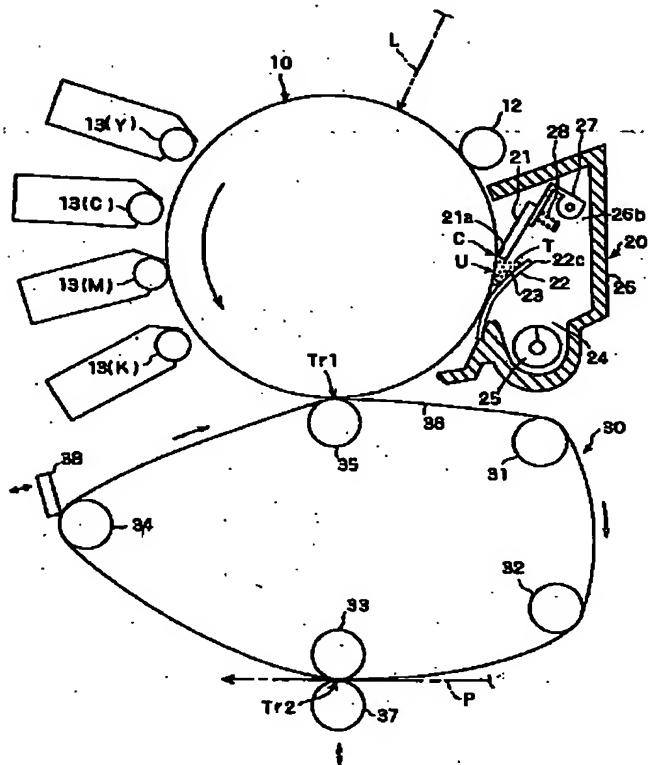
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DRAWINGS

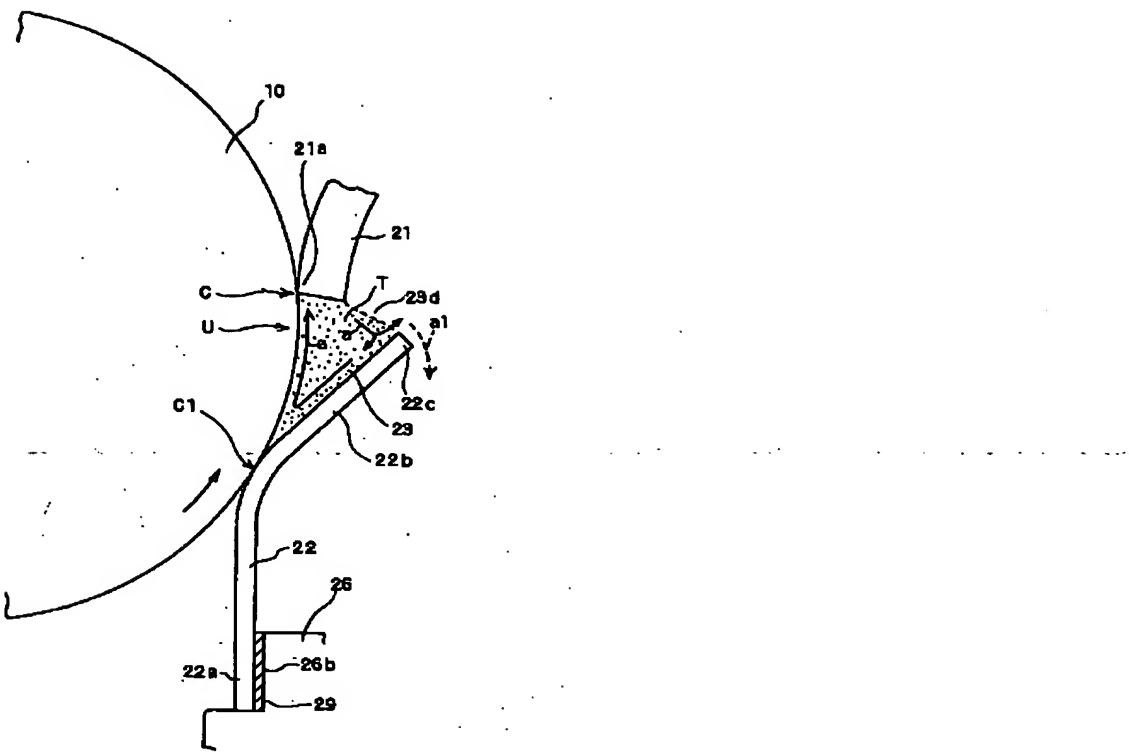
[Drawing 1]

7 4 1 0 9 - 1



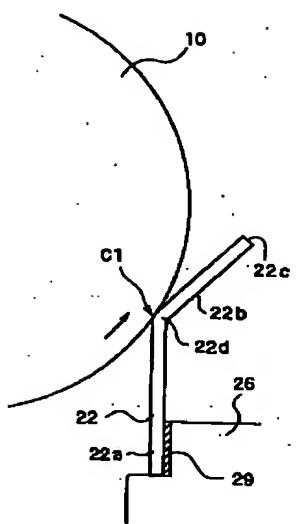
[Drawing 2]

7 4 1 0 9 - 2



[Drawing 3]

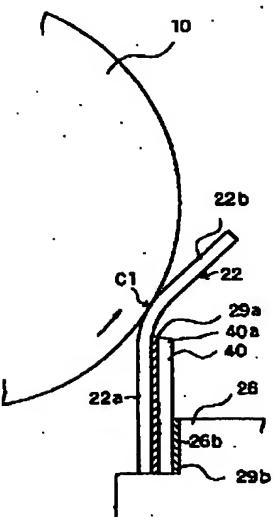
7 4 1 0 9 - 3



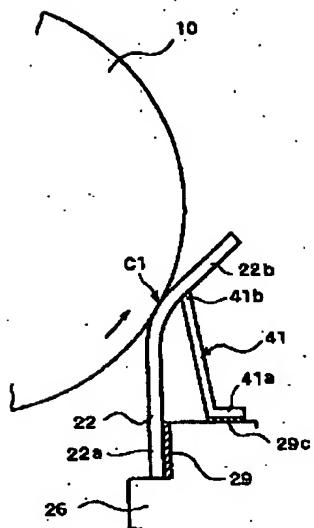
[Drawing 4]

7 4 1 0 9 - 4

(a)



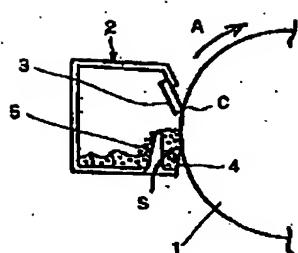
(b)



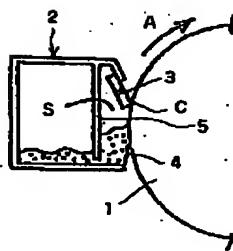
[Drawing 5]

74109-5

(a)



(b)



[Translation done.]

トナーを所定帶電極性に帯電させる材料で構成されてい
ることを特徴とする。

クリーニング性能の向上が、より一層良好に得られる

留しているトナー（残留トナー）は、ある極性に捕捉されたものと、それとは逆極性となったものが混在した状態である。この混合したトナーを「残留トナー」と呼ぶ。

[016] クリーニング装置 2 は、上記手順後に、
感光部 1 の外周面に残留し付着しているトナー（黒色
トナー）を優しく拭き取る感光用ブレード（クリーニングブ
レード）2 1 と、このブレード 2 1 によって拭き取ら
れたトナーを下するトナーを堆積させる堆積部 2 3 と、この堆
積部 2 3 から堆出されたトナーを受け取る受け部 2 4 と、
この受け部 2 4 内のトナーを示すしない弱トナーボトル
に輸送するスリュー 2 5 と、ケース 2 6 を備えてい
る。

る。さらに、トナー部が、すくいシートの先端部を像由物部は斜面と間隔を保てて延長したその延長部で形成され、すくいシートと像由物部との接触部においては像由物部表面と前記延長部の間隔が小幅度近くにおいては像由物部表面と前記延長部の間隔がおおよそ等しくなってトナーが整理や分離されることとなる。
【0010】なお、從来のクリーニング装置として、図5（a）あるいは（b）に示すように、矢印A方向へ回転する像由物部1とクリーニングブレード3との接觸部

際に、また、堆積された後にすくいシートと接触しある
いは直接することによって、堆積されたトナーが同種性
をそろえられることとなる。したがって、堆積されたト
ナーやその質感がさきに向上し、フレーと組合せ特
徴のどの感覚がより一層確実に向上した。上所述したブ
レードの捲れ抑制作用およびクリーニング性能の向上
が、より一層確実に得られることとなる。

印方向に回転駆動される。感光体 10 の周りには、その回転方向に沿って、帯電手段としての帯電ローラ 12、現像手段としての現像ローラ 13 (Y, C, M, K)、中間部装置 30、およびクリーニング装置 20 が配置されている。
【0015】 带電ローラ 12 は、感光体 10 の外周面に当接して外周面を一端に帯電させる。一端に帯電した感光体 10 の外周面には、図示しない電光ユニットによつて

この現象は、物体の表面に平行な光線が形成される場合によつて、その反射光線によって静電誘導が形成される。この静電誘導は、現像ローラ 1.3 でトナーが付与されて現象される。この実施の形態では、現像ローラとしテ、イエロー用の現像ローラ 1.3 Y、シアン用の現像ローラ 1.3 C、マゼンタ用の現像ローラ 1.3 M、およびブルック用の現像ローラ 1.3 K が設けられている。これら現像ローラ 1.3 Y、1.3 C、1.3 M、1.3 K は、選択的に感光部 1.0 に接するようになっており、当接したとき、イエロー、シアン、マゼンタ、ブルックのうちのいずれかのトナーを感光部 1.0 の表面に付与して感光部 1.0 上の静電誘導を現象する。現象されたトナーは、後述する中間転写部としての中間転写ベルト 3.6 上に転

像が転写された後に担持体上に残るトナーの像

50 すれば、二の実施の形態における「いシニト」は、

従来一般に知られたすくいシートよりも早く（像組合体1の回転方向に偏して最も早く）構成されおり、この最も構成された部分（延長部）で前記トナー部2とベルト2を構成することとなる。すなわち、從来一般に知られることなくして、感光体10が前記トナー部2とベルト2を構成される。したがって、トナーが前記トナー部2は、上方に向かって徐々に感光体表面との間隔が大きくなるようにならざる。

【0023】 駆動ローラ31は、その端部に固定された図示しない直管が、感光体10の驱动用直管（図示せず）と組み合うことによって、感光体10と駆動ローラ31の周邊で回転運動する際、感光体10と駆動ローラ31が感光体10と駆動ローラ31の周邊で図示した直管方向に感動運動される。駆動ローラ35は、一次軸写ローラであり、中間軸写ベルト3介して感光体10に圧接されていて、この圧接部において感光体10と中間軸写ベルト3との間に一次軸写部T1を形成している。駆動ローラ31には、中間軸写ベルト3を介して図示しない電極ローラが配置され、その電極ローラを介して、中間軸写ベルト3に一次軸写電圧が印加されるようになっている。從動ローラ32はテンションローラであり、図示しない付箋手段によつて中間軸写ベルト3をその張り方に対して、從動ローラ3は、二次軸写部T2を形成している。從動ローラ32は、二次軸写部T2を形成するバッファローラである。このバッファアップローラ3には、中間軸写ベルト3を介して二次軸写ローラ37が向面側される。二次軸写ローラ37は、図示しない接觸機構により中間軸写ベルト3にに対して接觸可能である。二次軸写ローラ37には、二次軸写電圧が印加される。從動ローラ34は、クリーンング手段38のためのバッファローラである。クリーンング手段38は、中間軸写ベルト3と接觸してその外周面に付箋手段39を介して感動する通路で、堆積部23に吸客されきになくなつた余剰のトナーは、矢印a1で示すように前記受け部24へと溢れ出すこととなるが、感光体10およびすくいシート22が感動運動していることによつて、堆積部23の上部には、比較的大粒径のトナーが集まりやすくなる。したがつて、矢印a1で示すように受け部24へと溢れ出すトナーのほとんどは大粒径のトナーとなり（大粒径のトナーが優先的に放出することによって、堆積部23の上部には、比較的小粒径のトナーが集まりやすくなる。このため、比較的小粒径のトナーが感光体10とブレード10との接觸部Cに堆積され易くなる。なお、トナーTは、常に紙粉等の異物が混入してしまつて、上記微振動の作用によって、異物が優先的に溢れ出することとなるので、異物が前記接觸部Cに供給されてしまうという事態も生じにくくなる。

【0024】 また、この実施の形態におけるすくいシート2の表面R2とは、トナー粒度の1/5以下となるようになっており、トナーを所定帶電電圧に帯電させる方向となる。材料を選択するにあれば、すくいシート2は、トナーを所定帶電電圧に帯電させる材料で構成されている。なお、ケース2.6は、保管材料、例えば硬質の合成樹脂等で構成されている。

【0025】 中間軸写部T2の上に示すような画像形成装置全体の作動は次の通りである。なお、ケース2.6は、保管材料、例えは硬質の合成樹脂等によって構成されている。

【0026】 以上のようなクリーンング装置は、ケース2.6によってユニットとして構成されており、画像形成装置本体の図示しないフレームに収納可能な取り付けられている。

【0027】 中間軸写装置30は、駆動ローラ31と、4本の從動ローラ32、33、34、35と、これら各ローラに張り付けられた中間軸写部としての無端子中間軸写ベルト3と、二次軸写ローラ37と、クリーンング手袋38と一緒に構成されている。

(M.) の画像情報に応じた適切的な露光がなされ、マゼンタ用の静電潜像が形成される。

(i) 感光体10には、第1色目（例えばマゼンタ）用の現像ローラ1 Mのみが接着され、これによつて上記静電潜像が現像され、第1色目（例えばマゼンタ）のトナーが感光体10上に形成される。

(v) 中間軸写ベルト3には上記トナーが感光体10上に形成逆性の一次軸写電圧が印加され、感光体10上に形成されたトナー像が、一次軸写部T1すなわち、感光体10は、上方に向かって徐々に感光体表面との間隔が大きくなるようにならざる。

(vi) 中間軸写ベルト3上に軸写される。このとき、二次軸写ローラ37およびクリーンング手段38は、中間軸写ベルト3から離間している。

(vii) 感光体10上に残留しているトナー（一次軸写トナー）が感光体用ブレード21によって除去された場合もブレード21後、図示しない除電手段からの除電光によって感光体10が充電される。

(viii) 上記(i)～(vi)の動作が必要に応じて繰り返される。すなわち、上記印字指令信号の内容に応じて、第2色目、第3色目、第4色目、と繰り返され、上記印字指令信号の内容に応じたトナー像が中間軸写ベルト3上において重ね合わせて中間軸写ベルト3上に形成される。

(ix) 所定のタイミングで記録媒体Pが供給され、記録媒体Pの先端が二次軸写部T2に達する直前にあるいは運搬した後に、記録媒体P上に所置の3.6上に軸写される。その後、中間軸写ベルト3上に形成される。

(x) 上記(i)～(viii)の動作がなされた後、上記印字指令信号が所定時間入力されない場合は装置の電源が除去される。

(xi) 記録媒体Pが図示しない定着装置を通して中間軸写ベルト3.6に於ける軸写が終了し、その後、タイミングで、二次軸写ローラ37が中間軸写ベルト3上に軸写されるとともに二次軸写電圧が印加され、中間軸写ベルト3.6上のトナー像（基本的にはフルカラー画像）が記録媒体P上に軸写される。また、中間軸写ベルト3.6は、すぐいシート2.2の先端部T2.2を記録媒体Pの先端が二次軸写部T2.2に接觸する間に摩擦角が低下することによって、上記軸写手段が安定し、軸写とし、クリーンング性能が一層向上することとなる。

(xii) しかも、クリーンングブレード2.1で引き抜かれる。この画像形成装置によれば、ブレード2.1と像組合体1.0を接觸する間に摩擦角が低下することによって、上記軸写手段が安定し、軸写とし、クリーンング性能が一層向上することとなる。

(xiii) しかし、ブレード2.1で引き抜かれたトナーを像組合体1.0とクリーンングブレード2.1との接觸部Cおよびその直下部Uに常に接觸させて、上記軸写手段が安定することによって、上記軸写手段が安定し、軸写とし、クリーンング性能が一層向上することとなる。

(xiv) これが繰り返されると、トナーが中間軸写ベルト3.6の張り出し部に押出される。

(xv) 上記(i)～(xii)の動作がなされた後、上記印字指令信号が所定時間入力されない場合は装置の電源が切られる。その後、中間軸写ベルト3.6に軸写される。

(xvi) 記録媒体Pが図示しない定着装置を通して中間軸写ベルト3.6に於ける軸写が終了し、その後、タイミングで記録媒体P上にトナー像が軸写される。

(xvii) 1002.6】以上のようないくつかの問題が発生する。

(a) トナー像が軸写された後に像組合体1.0上に軸写する回軸部である像組合体1.0上に軸写する回軸部である像組合体1.0の表面に接觸するクリーンングブレード2.1によって強引に軸写され、この強引に軸写されたトナーがすくいシート2.2で除電される。

(b) この画像形成装置によれば、すくいシート2.2の先端部T2.2が像組合体1.0表面と間隔を保つて正反対の像組合部2.2が像組合

(M.) の画像情報に応じた適切的な露光がなされ、マゼンタ用の静電潜像が形成される。

(i) 感光体10には、第1色目（例えばマゼンタ）用の現像ローラ1 Mおよびクリーンング手段3と、

(ii) 中間軸写ベルト3には上記トナーが感光体10上に形成逆性の一次軸写電圧が印加され、感光体10とクリーンング手段3およびクリーンング手段3と、

(iii) 感光体10上に形成されたトナーが像組合体1.0とクリーンング手段3と、

(iv) 中間軸写ベルト3と、

(v) 中間軸写ベルト3と、

(vi) 中間軸写ベルト3と、

(vii) 中間軸写ベルト3と、

(viii) 中間軸写ベルト3と、

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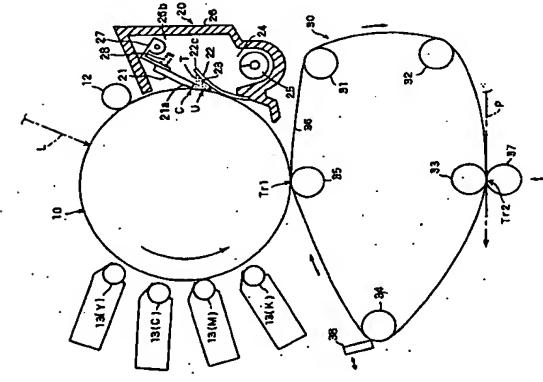
(xxv) 中間軸写ベルト3と、

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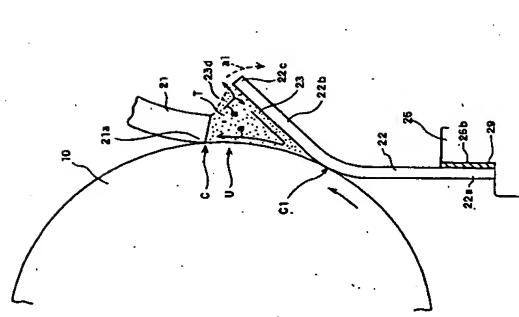
(10)

15	感光体(像保持体)	2.6	ケース
21	クリーニングフレード	4.0,	4.1 支撑部材
22	すくいシート	C	ブレードと感光体との接触部
22 b	延段部(トナー落部)	U	直下部
22 c	先端部	C 1	すくいシートと感光体との接触部

[21]

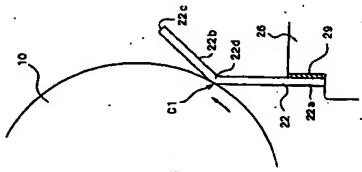


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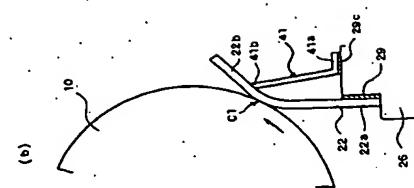


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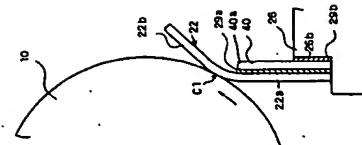
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□



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[4]



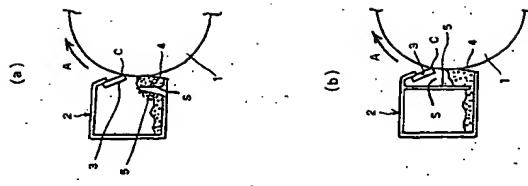
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【図5】

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フロントページの焼き

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CA04